

**WHAT IS CLAIMED IS:**

- 1       1. A thermionic electric converter comprising:  
2           a casing member;  
3           a cathode within said casing member having a cathode emitter operable,  
4       when heated, to serve as a source of electrons;  
5           a target structure within the casing member comprising an anode operable  
6       to receive electrons emitted from the cathode emitter; and  
7           a cathode output enhancing device operable to increase an excitation  
8       energy of electrons disposed at said cathode emitter.
  
- 1       2. A thermionic electric converter as set forth in Claim 1 wherein said  
2       cathode output enhancing device comprises a cathode enhancing laser  
3       positioned to direct a laser beam to strike an emissive surface of said cathode  
4       emitter.
  
- 1       3. A thermionic electric converter as set forth in Claim 2, wherein said  
2       cathode enhancing laser is positioned in the interior of said casing member.
  
- 1       4. A thermionic electric converter as set forth in Claim 3, wherein said  
2       cathode enhancing laser is controlled by a rastering device operable to cause  
3       the laser beam to sweep across said emissive surface of said cathode.
  
- 1       5. A thermionic electric converter as set forth in Claim 4, wherein said  
2       rastering device is operable to cause the laser beam to sweep across  
3       substantially the entire emissive surface of said cathode.

1        6. A thermionic electric converter as set forth in Claim 2 wherein said  
2        cathode is positioned at a first side of said anode, and said cathode  
3        enhancing laser is positioned at a second side of said anode opposite said  
4        first side.

1        7. A thermionic electric converter as set forth in Claim 6, wherein said anode  
2        has an opening therein to allow a laser beam emanating from said cathode  
3        enhancing laser to pass therethrough.

1        8. A thermionic electric converter as set forth in Claim 7, wherein said  
2        opening in said anode is located substantially in a center of said anode.

1        9. A thermionic electric converter as set forth in Claim 7, wherein said target  
2        structure further comprises an electron repulsion ring positioned in the  
3        opening in said anode, said electron repulsion ring having an opening  
4        therethrough.

1        10. A thermionic electric converter as set forth in Claim 9, wherein said  
2        electron repulsion ring is joined to said anode by an electrically insulating ring  
3        positioned at an edge of said opening in said anode.

1        11. A thermionic electric converter as set forth in Claim 10, wherein said  
2        electron repulsion ring is operatively coupled to a source operable to impose a  
3        negative charge on said electron repulsion ring.

1        12. A thermionic electric converter as set forth in Claim 7 wherein said target  
2        structure further comprises a highly statically charged ring disposed at an  
3        outer periphery of said anode.

1        13. A thermionic electric converter as set forth in Claim 12 wherein said  
2        anode and said highly statically charged ring are joined together via an inner  
3        insulating ring, and wherein said highly statically charged ring has an outer  
4        insulating ring adapted to mount said target structure inside said casing  
5        member.

1        14. A thermionic electric converter as set forth in Claim 1, wherein said  
2        cathode emitter comprises a wire grid having wires going in at least two  
3        directions that are transverse to each other.

1        15. A thermionic electric converter as set forth in Claim 1, wherein said anode  
2        is a substantially planar plate anode.

1        16. A thermionic electric converter as set forth in Claim 1, further comprising  
2        an electron interference laser operable to hit electrons between the cathode  
3        and anode.

1        17. A thermionic electric converter as set forth in Claim 2, further comprising  
2        an electron interference laser operable to hit electrons between the cathode  
3        and anode.

1 18. A thermionic electric converter as set forth in Claim 1 further comprising at  
2 least one electret positioned within said casing member and being operable to  
3 scavenge stray electrons present within said casing member.

1 19. A thermionic electric converter comprising:  
2 a casing member;  
3 a cathode within said casing member having a cathode emitter operable,  
4 when heated, to serve as a source of electrons,  
5 a target structure within the casing member comprising an anode  
6 operable to receive electrons emitted from the cathode emitter;  
7 a cathode enhancing laser positioned to direct a laser beam to strike an  
8 emissive surface of said cathode emitter; and  
9 a controller operable to raster said laser beam across said emissive  
10 surface of said cathode emitter.

1 20. A thermionic electric converter as set forth in Claim 19, wherein said  
2 cathode and said cathode enhancing laser are positioned on opposite sides of  
3 said target structure, and  
4 wherein said anode has an opening therein to allow a laser beam  
5 emanating from said cathode enhancing laser to pass therethrough; and  
6 wherein said target structure further comprises an electron repulsion ring  
7 positioned at said opening in said anode, and a highly statically charged ring  
8 extending around an outer periphery of said anode, operable to aid in  
9 attracting electrons in said casing member toward said anode.

- 1 21. A thermionic electric converter as set forth in Claim 20, further comprising
- 2 an electron interference laser operable to hit electrons between the cathode
- 3 and anode.